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## First testing results of an improved multi-dimensional bunch shape monitor

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Measuring longitudinal beam parameters is key for the operation and development of high-intensity linear accelerators but is notoriously difficult for ion beams at non-relativistic energies. The Bunch Shape Monitor (BSM) is a device used for measuring the longitudinal bunch distribution in a hadron linac. RadiaBeam has developed a BSM prototype with enhanced performance, integrating several key innovations. Firstly, to improve the collection efficiency, we introduced a focusing field between the target wire and the entrance slit. Secondly, we implemented a novel design of the RF deflector to enhance beam linearity. Finally, the design was enriched by incorporating a mechanism that allows moving both the wire and deflector cavity enabling the functionality of transverse profile measurements. In this paper, we present the process of fabricating, assembling, and beam tests of the BSM prototype at the SNS facility.

### Footnotes

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